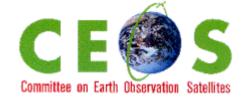




CNES Data Services Activity





Context

Part of CNES R&D activity related to EO data systems Objective :

understand the problem of attaching services to datasets in addition to metadata

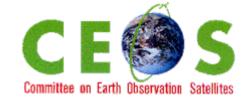
Way to reach the objective :

- develop a prototype for testing the resulting concepts on real datasets and services based on:
 - a mechanism for service scheduling and execution (workflow)
 - a catalogue of thematic services

Background:

- experience with the development of a Clearinghouse hosting metadata
- knowledge of work going on within ISO and OGC in the field of services





User requirement analysis (1/6)

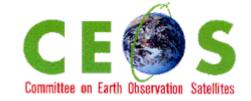
Questionnaire

- circulation of a questionnaire going to a set of representative scientific users of EO data and face to face discussions in order to understand their needs and their expectations
- identification of most frequently expected services
- identification of a description model suited to these services
- selection of a first subset of services which could be stored in a "service clearinghouse"

Methodology applied

- get a list of scientists working in the 3 main EO disciplines
 - ocean, atmosphere, solid earth
- get users from various kind of research
 - fundamental, applied, modelling
- get users with various levels of experience in data manipulation
 - manager, senior scientist, junior scientist
- get users from most important research institutes (in France)



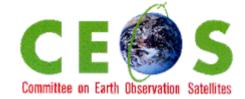


User requirement analysis (2/6)

Statistical results

- level of experience
 - junior11
 - senior8
 - manager 4
- discipline
 - atmosphere 4
 - ocean 10
 - solid earth
- domain scale
 - global
 - local8
 - meso 3
 - regional 8
- type of research
 - fundamental 2
 - applied 17
 - modelling 4



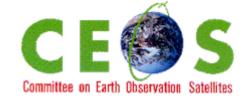


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User requirement analysis (3/6) Topics covered by the questionnaire

- domain of activity of the individual
- domain of activity of the group
- EO data used
- data providers
- data products produced
- processes used
- software used
- data difficult to get
- obstacles encountered
- servers and catalogues being used
- example of efficent server or catalogue
- what is missing for data localization in France?
- is the scientific work hindered by technical constraints on the use of data?
- expected services
- definition of a "clearinghouse for services"
- efforts scientists are ready to make for the build of such a system
- suggestions





User requirement analysis (4/6)

Expected Services	Weighted result
availability of software modules for reading data	200
data formats descriptions	200
data description	197
documentation of processing software modules	185
availability of processing modules	154
data localization	144
subsetting	138
batch processing for producing higher level product	s 132
availability of level 3 products or higher	124
supersetting	100

Service Definition

- scientists had to choose one among four different sugested definitions of a service
 - a small majority (7) chose the most exhaustive and complicated one
 - answers equally spread over the 3 remaning definitions



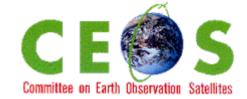


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User requirement analysis (5/6) Major kinds of processing used

atmospheric corrections	10
geometric corrections	8
radiation transfer inversion	6
model coupling	5
calibration	5
cloud discrimination	4
statistic	3
biophysical algorithms	2
geophysical corrections	2
georeferrencing	2
temporal series inversion	2
quantification algorithms	1
data assimilation	1
radiometric corrections	1
interferometry methods	1
multi-sensor	1
pattern recognition	1
geodetic transformations	1





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User requirement analysis (5/6)

Software tools used

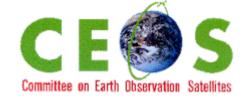
ENVI	7
In house developed	5
IDL	5
MATLAB	5
SEADAS	4
ERDAS Imagine	3
6S	2
AAPP	1
ARCV View	1
BDC	1
BERNESE (GPS)	1
ER Mapper	1
MSPHINX	1
OS	1
PV-Wave	1

Reading routines

SMAC

TRISKEL



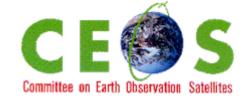


User requirement analysis (6/6)

Users say they are ready to:

document their data in their institutes	70 %
answer questions from a clearinghouse servant	70 %
reference their data in CNES clearinghouse	60 %
document their processing modules in their institute	56 %
share their modules with other community members	52 %





Conclusion

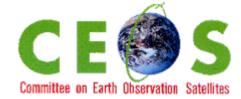
Most users agree with following defintion of a service clearinghouse:

"Complete system devoted to localisation, as a metacatalogue allowing subsetting, supersetting, job launching for data level upgrade, and providing previsualization and statistics tools."

Such system should provide following generic services:

- selection of a geographic area
- selection of a time period
- selection of a thematic
- list of datasets available according to these 3 criteria
- selection of a data subset
- list of available applicable processes
- processing workflow set up
- execution of the processing workflow on a selected datasets
- result exploration (dynamic mapping, statistics)
- retrievial of the processing results





The way ahead

Proceed stepwise

- implement the CNES metadata clearinghouse
- extend it to support data services
- first implement a limited set of services

Look at existing systems

DODS?

Stick to existing standards

ISO 19119

Look at emerging technologies

GRID